In the Claims:

Claims 1-10 (Cancelled)

11. (Currently amended): A method for reconstructing a three-dimensional scene using a reconstruction device including a light source, an optical system and a hologram encoded on a hologram-bearing medium having a matrix of cells; the hologram-bearing medium and the optical system being illuminated by the light source; and the optical system imaging the light source into an image plane of the light source; the method comprising the steps of:

(i) the optical system generating an inverse Fourier transform of the hologram encoded on the hologram-bearing medium at the image plane of the light source;

(ii) providing a viewing window [[in]] at the image plane of the light source, the viewing window being the location where an observer places at least one eye to view the holographic reconstruction representing the three-dimensional scene, and, the size of the viewing window being no larger than a single diffraction order of the light diffracted by the hologram-bearing medium; [[and]]

(iii) encoding the hologram on the hologram-bearing medium to reconstruct a given object point of the three-dimensional scene, when seen from the viewing window, in only a limited region of the hologram-bearing medium, so that the inverse Fourier transform in the viewing window is restricted to a single diffraction order of the light diffracted by the hologram-bearing medium; and

(iv) forming the holographic reconstruction of the three-dimensional scene from the hologram encoded in the hologram bearing medium within a reconstruction frustum stretching between the hologram-bearing medium and the viewing window.

12. (Previously presented) The method of Claim 11, wherein the viewing window is positioned in relation to an eye of an observer.

13. (Previously presented) The method of Claim 11 in which the holographic reconstruction of the three-dimensional scene is made up of multiple discrete points and the hologram on the hologram-bearing medium comprises the limited region with information needed to reconstruct one such single point in the reconstruction, the point being visible from the viewing window, and is characterized in that the limited region:

(a) is encoded with information for that single point in the reconstruction and

(b) is the only limited region in the hologram encoded with information for that point, and

(c) is restricted in size to form a portion of the entire hologram, the size being such that multiple reconstructions of that point caused by higher diffraction orders are not visible at the viewing window.

14. (Previously presented) The method of Claim 13 in which the limited region has been generated by a projection from the viewing window through the single point onto the hologram-bearing medium.

15. (Previously presented) The method of Claim 11 comprising the step of time sequentially re-encoding a hologram on the hologram-bearing medium for one eye and then the other eye of an observer.

16. (Previously presented) The method of Claim 11 in which the holographic reconstruction representing the three-dimensional scene is described by the Fresnel transform of the hologram being encoded in the hologram-bearing medium and the holographic reconstruction representing the three-dimensional scene is not described by the Fourier transform of the hologram being encoded in the hologram-bearing medium.

17. (Cancelled)

18. (Previously presented) The method of Claim 11 in which the size of the viewing window is calculated by a computing means in dependence of the extension of the periodicity interval of the hologram bearing medium.

19. (Previously presented) The method of Claim 11 in which the size of the viewing window is smaller than the size of the hologram-bearing medium.

20. (Previously presented) The method of Claim 11 in which there are separate viewing windows, one for each eye of the observer.

21. (Previously presented) The method of Claim 20 in which each viewing window is approximately 1cm x 1cm.

22. (Previously presented) The method of Claim 20 in which the locations of an observer's eyes are tracked and the positions of the viewing windows are altered so that the

observer can maintain a view through each viewing window even when moving his or her head.

23. (Previously presented) The method of Claim 11 in which the light source includes one or more individual light sources.

24. (Cancelled)

25. (Previously presented) The method of Claim 11, in which the light source is a lineshaped light source.

26. (Previously presented) The method of Claim 11, in which the light source is a real light source.

27. (Cancelled)

28. (Previously presented) The method of Claim 11, in which the light source is a point light source.

29. (Previously presented) The method of Claim 11, wherein several light sources are turned on to generate viewing windows for several observers.

30. (Cancelled)

31. (Previously presented) The method of Claim 11, wherein information required to determine the position of the light source is provided by at least one position sensor that measures the position of the observer.

32. (Previously presented) The method of Claim 11 comprising the steps of assigning a first viewing window to a first eye of a viewer and also assigning a second viewing window to the other eye of the viewer, the second viewing window being generated using a second light source.

33. (Previously presented) The method of Claim 32, wherein the optical system and the hologram-bearing medium are arranged so that higher diffraction orders of the hologram for the first viewing window have a zero point or an intensity minimum at the position of the second viewing window.

34. (Previously presented) The method according to Claim 33, wherein the hologram-bearing medium is re-encoded for the second eye at the same time as the second viewing window is generated.

35. (Previously presented) The method of Claim 11, wherein the holographic reconstruction is in color, and wherein the hologram-bearing medium is composed of cells arranged in a regular pattern with at least three openings per cell, representing the three primary colors, the phase or the amplitude or the phase and the amplitude of light from the light source being controllable by said openings by encoding the hologram into the hologram bearing medium, and said openings being encoded individually for each primary color.

36. (Previously presented) The method of Claim 11, wherein a color reconstruction is achieved by at least three reconstructions in the individual primary colors, generated sequentially.

37. (Previously presented) The method of Claim 11, in which the hologram-bearing medium is a TFT display.

38. (Previously presented) The method of Claim 11 in which the hologram-bearing medium controls phase of light of the light source.

39. (Previously presented) The method of Claim 11 in which the hologram-bearing medium controls amplitude of light of the light source.

40. (Previously presented) The method of Claim 11 in which the hologram-bearing medium controls phase and amplitude of light of the light source.

41. (Currently amended) A reconstruction device for reconstructing a three-dimensional scene including a light source, an optical system and a hologram encoded on a hologram-bearing medium having a matrix of cells, the hologram-bearing medium and the optical system being illuminated by the light source and the optical system imaging the light source into an image plane of the light source; in which:

(i) the optical system generates an inverse Fourier transform of the hologram encoded on the hologram-bearing medium at the image plane of the light source; ~~and~~

(ii) the reconstruction device generates a viewing window in the image plane of the light source, the viewing window being the location where an observer places at least one eye to view the holographic reconstruction representing the three-dimensional scene, ~~the hologram encoded on the hologram-bearing medium to reconstruct a given object point of the three-dimensional scene, when seen from a viewing window, which is in the image plane of the light source and is where an observer places at least one eye to view the holographic reconstruction representing a three-dimensional scene, is encoded in only a limited region of the hologram-bearing medium, so that the inverse Fourier transform at the viewing window is restricted to a single diffraction order of the light diffracted by the hologram-bearing medium~~; and

(iii) the reconstruction device forms the holographic reconstruction of the three-dimensional scene from the hologram encoded in the hologram bearing medium within a reconstruction frustum stretching between the hologram-bearing medium and the viewing window.

42. (Previously presented) The device of Claim 41 further including a position sensor to track the location of the observer's eye or eyes.

43. (Previously presented) The device of Claim 41 in which the device includes a TFT flat screen as the hologram-bearing medium.

44. (Previously presented) The device of Claim 41 in which the device is a television.

45. (Previously presented) The device of Claim 41 in which the device is a multimedia display device.

46. (Previously presented) The device of Claim 41 in which the device is a gaming device.

47. (Previously presented) The device of Claim 41 in which the device is a medical image display device.

48. (Previously presented) The device of Claim 41 in which the device is a military information display device.

49. (Cancelled)

50. (Cancelled)

51. (Previously presented) The device of Claim 41, wherein the viewing window is positioned in relation to an eye of an observer.

52. (Previously presented) The device of Claim 41 in which there are separate viewing windows, one for each eye of the observer.

53. (Previously presented) The device of Claim 52 in which the locations of an observer's eyes are tracked and the positions of the viewing windows are altered so that the

observer can maintain a view through each viewing window even when moving his or her head.

54. (Previously presented) The device of Claim 41 in which the light source includes one or more individual light sources.

55. (Cancelled)

56. (Previously presented) The device of Claim 41, in which the light source is a lineshaped light source.

57. (Previously presented) The device of Claim 41, in which the light source is a real light source.

58. (Cancelled)

59. (Previously presented) The device of Claim 41, in which the light source is a point light source.

60. (Cancelled)

61. (Previously presented) The device of Claim 41, in which the hologram-bearing medium is a TFT display.

62. (Previously presented) The device of Claim 41 in which the hologram-bearing medium controls phase of light of the light source.

63. (Previously presented) The device of Claim 41 in which the hologram-bearing medium controls amplitude of light of the light source.

64. (Previously presented) The device of Claim 41 in which the hologram-bearing medium controls phase and amplitude of light of the light source.